

CLAIMS

What is claimed is:

- 5 1. A method for removing contamination from commutators and brushes of a DC motor operationally connected to an apparatus having a predetermined range of motion, comprising the steps of:
 - a) actuating said motor in a first rotational direction to drive said apparatus to a first extreme in said range; and
 - 10 b) actuating said motor in a second and opposite rotational direction to drive said apparatus to a second and opposite extreme in said range.
- 15 2. A method in accordance with Claim 1 wherein said apparatus is an intake air control valve for an internal combustion engine and said motor is an actuator of said valve.
- 20 3. A method in accordance with Claim 1 wherein motion is rotational and wherein said range is about 90°.
- 25 4. A method in accordance with Claim 2 wherein said engine is mounted in a vehicle having an engine ignition system, comprising the further step of determining that said ignition system is in a shut-off state.
- 30 5. A method in accordance with Claim 4 wherein motion of said motor actuator and said intake air control valve is controlled by a programmable electronic controller, and wherein said controller is programmed with an algorithm for controlling said steps.
6. A method in accordance with Claim 5 wherein said algorithm for controlling said steps is carried out in no more than 33 milliseconds.

7. In an intake air control system for an internal combustion engine, the system including an intake air valve having a predetermined range of motion and being actuated by a DC motor having at least one commutator and at least one brush, and a programmable controller for controlling motion of the DC motor, 5 the improvement comprising:

programming said controller to firstly actuate said motor in a first rotational direction to drive said intake air valve to a first extreme in said range, and then to secondly actuate said motor in a second and opposite rotational direction to drive said intake air valve to a second and opposite extreme in said range,

10 said first and second actuations being intended to cause contaminants in said DC motor to be dislodged therefrom.

8. An internal combustion engine, comprising, an intake air control system including an intake air valve having a predetermined range of motion and 15 being actuated by a DC motor having at least one commutator and at least one brush, and a programmable controller for controlling motion of the DC motor, said controller being programmed to firstly actuate said motor in a first rotational direction to drive said intake air valve to a first extreme in said range, and then to secondly actuate said motor in a second and opposite rotational direction to drive 20 said intake air valve to a second and opposite extreme in said range, said first and second actuations being intended to cause contaminants in said DC motor to be dislodged therefrom.